

What is claimed is:

1. An area array package comprising:

a substrate having a coupling surface configured to couple to a circuit board, the  
5 coupling surface having a central area and a peripheral area surrounding the central area;

a grid array of primary electrical contacts coupled to the coupling surface within  
the central area defined by the coupling surface, the grid array of primary electrical  
contacts configured to carry at least data signals between the area array package and a  
circuit board; and

10 a series of secondary electrical contacts coupled to the coupling surface and  
oriented within the peripheral area defined by the coupling surface, the series of  
secondary electrical contacts configured to carry power signals between the area array  
package and the circuit board, the series of secondary electrical contacts being separate  
from the grid array.

15 2. The area array package of claim 1 wherein:

the primary electrical contacts of the grid array comprise a plurality of primary  
solder balls, each primary solder ball of the grid array defining a first diameter; and

the series of secondary electrical contacts comprise a plurality of secondary solder  
20 balls, each secondary solder ball of the series defining a second diameter, the second  
diameter defined by each of the secondary solder balls being greater than the first  
diameter defined by each of the primary solder balls.

3. The area array package of claim 1 wherein the substrate defines at least one power  
25 plane, at least one ground plane, and at least one plated through hole in communication  
with the at least one power plane and the at least one ground plane, the substrate further  
comprising a contact pad in electrical communication with the at least one plated through  
hole and configured to electrically couple with a secondary electrical contact of the series  
of secondary electrical contacts.

4. The area array package of claim 1 wherein the substrate comprises a power regulation device coupled to the substrate and in electrical communication with the series of secondary electrical contacts.

5 5. The area array package of claim 1 wherein the series of secondary electrical contacts comprises a plurality of solder balls coupled to the substrate at a pitch of at least approximately 5 mm.

6. The area array package of claim 1 wherein the substrate defines a length of at least  
10 approximately 60 mm and a width of at least approximately 60 mm.

7. A circuit board assembly comprising:

a circuit board; and

an area array package coupled to, and in electrical communication with, the

15 circuit board, the area array package having:

a substrate having a coupling surface coupled to the circuit board, the coupling surface having a central area and a peripheral area surrounding the central area;

20 a grid array of primary electrical contacts coupled to the coupling surface within the central area defined by the coupling surface, the grid array of primary electrical contacts configured to carry at least data signals between the area array package and the circuit board; and

25 a series of secondary electrical contacts coupled to the coupling surface and oriented within the peripheral area defined by the coupling surface, the series of secondary electrical contacts configured to carry power signals between the area array package and the circuit board, the series of secondary electrical contacts being separate from the grid array.

8. The circuit board assembly of claim 7 wherein:

the primary electrical contacts of the grid array comprise a plurality of primary solder balls, each primary solder ball of the grid array defining a first diameter; and

the series of secondary electrical contacts comprise a plurality of secondary solder balls, each secondary solder ball of the series defining a second diameter, the second  
5 diameter defined by each of the secondary solder balls being greater than the first diameter of each of the primary solder balls.

9. The circuit board assembly of claim 7 wherein the substrate defines at least one power plane, at least one ground plane, and at least one plated through hole in communication  
10 with the at least one power plane and the at least one ground plane, the substrate further comprising a contact pad in electrical communication with the at least one plated through hole and configured to electrically couple with a secondary electrical contact of the series of secondary electrical contacts.

15 10. The circuit board assembly of claim 7 wherein the substrate comprises a power regulation device coupled to the substrate and in electrical communication with the series of secondary electrical contacts.

11. The circuit board assembly of claim 7 wherein the series of secondary electrical  
20 contacts comprises a plurality of solder balls coupled to the substrate at a pitch of at least approximately 5 mm.

12. The circuit board assembly of claim 7 wherein the substrate defines a length of at least approximately 60 mm and a width of at least approximately 60 mm.

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13. A method for manufacturing an area array package comprising:

coupling a grid array of primary electrical contacts to a coupling surface of a substrate within a central portion defined by the substrate, the grid array of primary electrical contacts configured to carry at least data signals between the area array package  
30 and a circuit board; and

coupling a series of secondary electrical contacts to the coupling surface of the substrate within a peripheral area defined by the coupling surface, the series of secondary electrical contacts configured to carry power signals between the area array package and the circuit board, the series of secondary electrical contacts separate from the grid array.

14. The method of claim 13 further comprising:

forming the primary electrical contacts of the grid array as a plurality of primary solder balls, each primary solder ball of the grid array defining a first diameter; and

forming the series of secondary electrical contacts as a plurality of secondary solder balls, each secondary solder ball of the series defining a second diameter, the second diameter defined by each of the secondary solder balls being greater than the first diameter defined by each of the primary solder balls.

15. The method of claim 14 wherein the step of forming the series of secondary electrical contacts comprises:

placing at least two solder balls on a contact pad oriented within the peripheral area defined by the coupling surface, each solder ball defining a first diameter;

heating the at least two solder balls to cause the solder to undergo reflow;

forming a secondary solder ball on the contact pad, secondary solder ball of the defining a second diameter, the second diameter defined by the secondary solder ball being greater than the first diameter defined by each of the primary solder balls.

16. The method of claim 13 comprising coupling at least one power regulation device to the substrate and in electrical communication with the series of secondary electrical contacts.